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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Keiko Kawakami

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EXAMINER

CHAU, LINDA N

ART UNIT

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1794

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/550,747	Applicant(s) KAWAKAMI ET AL.	
	Examiner LINDA CHAU	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tezuka et al. (JP 2000-349312) and in view of Katayama et al. (JP 07-213995).

Regarding claim 1, Tezuka teaches a stainless steel substrate, with a thickness of 20-150 μm [0021], and an insulating layer, or an inorganic-organic hybrid film, with a thickness of 0.1 nm - 5 μm , which overlaps the thickness as claimed [0011]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the optimal amounts for each of the thickness range from the substrate and the film layer to satisfy the equation of the condition between the substrate and the film layer in order to achieve high performance (Abstract) (Ex: $T_f: 0.5 \leq (T_s: 20) / 40$).

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Furthermore, Tezuka teaches that the insulating layer comprises a skeleton formed with a siloxane bond [0025]-[0026]. However, Tezuka fails to mention that the crosslinked oxygen of the siloxane bond is being replaced by an organic group or a hydrogen group and also fails to mention the concentration ratio between the hydrogen and the silicon. Katayama teaches a steel sheet of an inorganic-organic composite material in which the skeleton of M-O-M is substituted by O-Si(R)₂-O, which would intrinsically replace the oxygen to a organic/hydrogen group due to the hydrolyzation of an alkoxide and dialkyl dialkyoxyl silane (Abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tezuka's with the teachings of Katayama in order to obtain a high corrosion and heat resistant steel sheet (Abstract). Further Katayama teaches that the organic/inorganic component has a molar ratio of 8.0-0.1 (Abstract). Although Katayama doesn't specifically teach the concentration as presently claimed, it would be intrinsically clear that Katayama's concentration would encompass the concentration as claimed and that Katayama teaches similar materials as are used in the instant specification. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have Tezuka's concentration with the teachings of Katayama's concentration in order to obtain a high corrosion and heat-resistant properties (Abstract).

Regarding claim 2, Katayama teaches that the organic group is an alkyl group [0007].

Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tezuka et al. (JP 2000-349312), in view of Katayama et al. (JP 07-213995), and further in view of Kamiya et al. (JP411269657)

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Regarding claim 3, both Tezuka and Katayama doesn't teach the average roughness of the hybrid film. Kamiya teaches an inorganic-organic hybrid functional film having a roughness of 0.5 nm or less [0033]. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tezuka's hybrid film with the roughness taught by Kamiya, since Kamiya teaches that this will provide a smooth nature of the surface, which thus optimize the electrically insulating substrate of Tezuka.

Regarding claim 6, Tezuka, Katayama, and Kamiya doesn't teach the surface roughness of the stainless steel foil substrate. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tezuka's substrate with having at least 2.5 μm , so that the inorganic-organic hybrid film can easily adhere to the textured substrate. Further, since neither Tezuka nor Kamiya teaches the surface roughness of the substrate, it is intrinsically clear that the surface roughness is zero, thereby satisfying the equation. Furthermore, discovering the workable ranges involves only routine skill in the art.

Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tezuka et al. (JP 2000-349312) and in view of Yamada et al. (US 2002/0156180).

Regarding claim 1, Tezuka teaches a stainless steel substrate, with a thickness of 20-150 μm [0021], and an insulating layer, or an inorganic-organic hybrid film, with a thickness of 0.1 nm - 5 μm , which overlaps the thickness as claimed [0011]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the optimal amounts for each of the thickness range from the substrate and the film layer to satisfy the

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equation of the condition between the substrate and the film layer in order to achieve high performance (Abstract) (Ex: $T_f: 0.5 \leq (T_s: 20) / 40$).

Furthermore, Tezuka teaches that the insulating layer comprises a skeleton formed with a siloxane bond [0025]-[0026]. However, Tezuka fails to mention that the crosslinked oxygen of the siloxane bond is being replaced by an organic group or a hydrogen group and also fails to mention the concentration ratio between the hydrogen and the silicon. Yamada teaches a dielectric constant materials having a 3D network structure containing siloxane backbones wherein at least one of the crosslinked oxygens are replaced with organic groups [0010]. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tezuka with the teachings of Yamada in order to obtain low moisture absorption and a low dielectric constant [0008]. Further, Yamada teaches that the molar ratio of Si bonded to hydrogen is 0.3 or greater [0037]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Tezuka with the concentration of Yamada in order to obtain a material with low moisture absorption and low dielectric constant [0008].

Regarding claim 2, Yamada teaches an alkyl group as the organic group [0012].

Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tezuka et al. (JP 2000-349312), in view of Yamada et al. (US 2002/0156180), and further in view of Kamiya et al. (JP411269657)

Regarding claim 3, both Tezuka and Katayama doesn't teach the average roughness of the hybrid film. Kamiya teaches an inorganic-organic hybrid functional film having a roughness of 0.5 nm or less [0033]. It would have been obvious to one of ordinary skill in the art at the

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time of the invention to modify Tezuka's hybrid film with the roughness taught by Kamiya, since Kamiya teaches that this will provide a smooth nature of the surface, which thus optimize the electrically insulating substrate of Tezuka.

Regarding claim 6, Tezuka, Katayama, and Kamiya doesn't teach the surface roughness of the stainless steel foil substrate. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Tezuka's substrate with having at least $2.5\text{ }\mu\text{m}$, so that the inorganic-organic hybrid film can easily adhere to the textured substrate. Further, since neither Tezuka nor Kamiya teaches the surface roughness of the substrate, it is intrinsically clear that the surface roughness is zero, thereby satisfying the equation. Furthermore, discovering the workable ranges involves only routine skill in the art.

Response to Arguments

Applicant's arguments, filed 2/2/09, with respect to the rejection(s) of claim(s) 1-6 under Tezuka et al. (JP 2000-349312) and in view of Gray et al. (US 5,595,826) have been fully considered and are persuasive. Applicant argues that Gray does not teach at least one cross linked oxygen of the siloxane bond is being replaced by organic group and/or a hydrogen atom. Examiner respectfully agrees, therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Tezuka et al. (JP 2000-349312) and in view of Katayama et al. (JP 07-213995) and Tezuka et al. (JP 2000-349312) and in view of Yamada et al. (US 2002/0156180).

Further, applicant argues that Tezuka does not disclose $0.5\text{ }\mu\text{m} \leq T_f \leq 2\text{ }\mu\text{m}$ and $T_f \leq T_s/40$. However, the examiner respectfully disagrees as Tezuka teaches these limitations as set forth in claim 1.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LINDA CHAU whose telephone number is (571)270-5835. The examiner can normally be reached on Monday-Thursday, 8:00-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Bernatz, acting SPE for Carol Chaney can be reached on (571) 272-1505. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Holly Rickman/
Primary Examiner, Art Unit 1794
For Linda Chau

/Linda Chau/